Schedule

Week 1 (09/07-9/11)

- Day 1
  - Introduction to Theory of Computation[1]
  - Introduction to OCAML[2]
  - Assignment 1[3]
- Day 2
  - OCAML basics[4]
- Day 3
  - OCAML basics (cont)[5]
- Day 4
  - OCAML basics (cont)[6]
  - OCAML example: sets as lists (optional)[7]

Week 2 (09/14-09/18)

- Day 1
  - Alphabets, strings, substrings, empty string, lexicographic ordering[8]
  - Alphabet and friends in OCAML[9]
- Day 2
  - Languages, examples, constructions[10]
- Day 3
  - Languages, examples, constructions[11]
- Day 4
  - Deterministic Finite Automata[12]

[1] notes/theory_intro.html
[2] notes/ocaml_intro.html
[3] assignments/1.html
[4] notes/ocaml_basics.html
[5] notes/ocaml_basics.html
[6] notes/ocaml_basics.html
[7] notes/ocaml_sets.html
[8] notes/alphabet.html
[9] notes/ocaml_alphabet.html
[10] notes/languages.html
[11] notes/languages.html
[12] notes/fin_aut_dfa.html

Week 3 (09/21-09/25)

- Day 1
  - Deterministic Finite Automata (cont)[13]
- Day 2
  - DFAs in OCAML[14]
- Day 3
  - Regular Languages[15]
  - Union of regular languages is regular[16]
- Day 4
  - Implementation of union in OCAML[17]

Week 4 (09/28-10/02)

- Day 1
  - Non-deterministic automata, examples[18]
- Day 2
  - Implementation in OCAML
- Day 3
  - DFA equivalent to an NFA
  - Union / Intersection / Star of regular languages is regular
  - Regular Expressions
  - OCAML implementations
  - RegEx -> NFA
  - Nonregular languages
  - Pumping Lemma
  - Examples
  - Catching up
- Day 4
  - Midterm 1

[13] notes/fin_aut_dfa.html
[14] notes/ocaml_dfa.html
[15] notes/fin_aut_dfa.html
[16] notes/fin_aut_dfa.html
[17] notes/ocaml_dfa.html
[18] notes/fin_aut_nfas.html

Week 5 (10/05-10/09)

- Day 1
  - Context Free Grammars
  - Examples of derivations
- Day 2
  - Programming examples of CFGs
  - Ambiguous grammars
- Day 3
  - Chomsky Normal Forms
- Day 4
  - PushDown Automata definition

Week 6 (10/12-10/16)

- Day 1
  - PDAs more examples
  - OCAML implementation
- Day 2
  - CFG -> PDA
- Day 3
  - PDA -> CFG
- Day 4
  - Non-context-free grammars
  - Pumping lemma for CFGs

Week 7 (10/19-10/23)

- Day 1
  - Fall Break
- Day 2
  - Brief intro to parsers
- Day 3
  - More on parsers?
- Day 4
  - Turing Machines

Week 8 (10/26-10/30)

- Day 1
  - Turing Recognizable vs Turing Decidable languages
- Day 2
  - Multitape / Nondeterministic Turing machines
- Day 3
  - The Church-Turing thesis, algorithms
- Day 4
  - Decidable Problems, for regular languages

Week 9 (11/02-11/06)

- Day 1
  - The Halting Problem
- Day 2
  - Undecidability of Halting Problem
- Day 3
  - Catching up
- Day 4
  - Midterm 2

Week 10 (11/09-11/13)

- Day 1
  - Reducibility
- Day 2
  - Regularity of languages is undecidable
- Day 3
  - Time Complexity classes
- Day 4
  - The class P

Week 11 (11/16-11/20)

- Day 1
  - The class NP
- Day 2
  - P vs NP, NP-complete problems
- Day 3
- Day 4

Week 12 (11/23-11/27)

- Day 1
- Day 2
  - Thanksgiving Break
- Day 3
  - Thanksgiving Break
- Day 4
  - Thanksgiving Break

Week 13 (12/01-12/04)

- Day 1
- Day 2
- Day 3
- Day 4

Week 14 (12/07-12/11)

- Day 1
- Day 2
- Day 3
- Day 4